

REMARKS

Applicants thank the Examiner for acknowledging the claim for priority under 35 U.S.C. § 119, and receipt of a certified copy of the priority document submitted August 8, 2000.

Applicants respectfully request the Examiner to acknowledge the references cited with the Information Disclosure Statements filed November 28, 2000 and April 10, 2001.

Status of the Application

Claims 1-5 are all the claims pending in the Application. Claims 1-5 have been rejected. Claim 2 is editorially amended.

Objection to the Title

The Examiner has objected to the title as not descriptive, and has suggested a new title. Applicants hereby amend the title as the Examiner has suggested. Thus, Applicants respectfully request that the Examiner withdraw the Objection to the title.

Obviousness Rejections of Claims 1-5 Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1 and 3-5 under 35 U.S.C. § 103(a) as being unpatentable over Ohshima et al. (US 6,354,900 B1; hereinafter "Ohshima") in view of Jüngst et al. (EP 0609477 A1; hereinafter "Jungst").

As an initial matter, Applicants hereby remove Ohshima as a reference under 35 U.S.C. § 102(e). Applicants confirm that the instant Application and Ohshima were commonly assigned on the date of invention of the instant Application.

Additionally, Applicants respectfully submit that, even if Ohshima was a proper reference, the combination of Ohshima (or any other similar arc tube) and Jungst still would not teach or suggest the features of claim 1, for at least the reasons discussed below.

Claim 1

Ohshima discloses (FIG. 1) a quartz glass arc tube 2, spherical portion 4a, pinch sealed portions and electrode rods 8.

The Examiner has taken the position that Ohshima teaches all of the features of claim 1 except that Ohshima does “not exemplify the average roughness of the surface of the tungsten electrodes” (page 3, 1st full paragraph of the Office Action).

In order to attempt to supply the features of claim 1 that the Examiner believes are missing from the disclosure of Ohshima, the Examiner has applied Jungst. The Examiner has taken the position that Jungst discloses (col. 7, lines 13-16), a “tungsten feed-through having surface roughness about 0.5-50 μm which includes the range of 3 μm or smaller” and that (col. 4, lines 35-40) “this small value of surface roughness ... helps sintering the electrode with the quartz body without cracks being formed.” Further, the Examiner takes the position that it would have been obvious to modify the electrodes 8 of Ohshima with the feedthroughs 10 of Jungst because the combination would provide “the benefit of sealing the electrode with quartz body without cracks being formed and hence enhancing reliable long-time gas-tightness.”

Jungst discloses a lamp consisting of (FIG. 1) a quartz *outer* envelope 1 with pinch-sealed ends containing foils 5, which are in turn connected to current supply leads 6 and bases 3. An *alumina-ceramic* discharge vessel 8 with electrode systems 12 is provided. Feedthroughs 10a and 10b connect the electrode systems 12 and the current supply leads 6. The feedthroughs extend through *ceramic plugs* 11a and 11b disposed at opposite ends of the discharge vessel 8, and are disclosed as having surface roughness of about 0.5-50 μm (col. 7, lines 13-16).

Thus, Applicants respectfully submit that Jungst does not teach or suggest anything regarding the surface roughness of electrodes that are “pinch-sealed to said pinch seal portions,”

as recited in claim 1. In contrast, the feedthroughs cited by the Examiner are disposed in and *directly sintered to* ceramic plugs 11a and 11b, which are clearly not “pinch seal portions,” as recited in claim 1. Thus, the interface of feedthroughs to the ceramic plugs does not teach or suggest that such feedthroughs could be disposed in a pinch sealed portion.

In fact, Jungst provides no teaching or suggestion as to modification of any feature of the pinch sealed quartz arc tubes in Ohshima, or in the instant Application for that matter.

Specifically, Ohshima discloses a quartz glass arc tube and a discharge space created by pinch seals, while Jungst discloses a ceramic discharge vessel and a discharge space created by sintering ceramic plugs at the opposite ends of the ceramic discharge vessel. Thus, one of ordinary skill would not have looked to the disclosure of Jungst to modify the electrode of Ohshima, as the devices are completely different. Indeed, even the European search report that cited Jungst categorized it as an “A,” or “background” reference only.

Further, Applicants respectfully submit that the Examiner’s reasoning that “this small value of surface roughness ... helps sintering the electrode with the quartz body without cracks being formed” (2nd full paragraph, pg. 3 of the Office Action), is completely unsupported by Jungst. In fact, the section of Jungst cited by the Examiner to provide this reasoning (col. 4, lines 35-40) discloses that the “third important parameter is the relationship between the diameter of the plug hole and of the feedthrough. Direct sintering of these parts without cracks being formed during the sintering is feasible only if the shrinking of the plug itself during the final sintering is such that it corresponds to a slight pressing force.” Thus, the important parameter is disclosed as the relative diameters of the plug hole and feedthrough, not any surface characteristics of the feedthrough. In fact, Jungst is completely silent on any benefit of the range of surface roughness

disclosed in col. 7, lines 14-17. Thus, it cannot provide any teaching or suggestion that such surface roughness provides any benefit to the sintering or sealing of the feedthrough to the plug.

Lastly, Applicants respectfully submit that the Examiner's position that it would have been obvious to modify the electrodes 8 of Ohshima with the feedthroughs 10 of Jungst because the combination would provide "the benefit of sealing the electrode with quartz body without cracks being formed and hence enhancing reliable long-time gas-tightness" is also unsupported by either of the references. The Examiner is proposing that the disclosure of a surface characteristic of an electrode in a ceramic plug could be applied to an electrode in a pinch-sealed quartz glass. However, there is simply no teaching or suggestion that such surface characteristics of a feedthrough in a ceramic plug improve any feature of the bonding of a electrode in pinch sealed quartz glass, or reduce the potential of crack formation in such a combination. The feedthrough of Jungst and the electrode of Ohshima are bonded to two completely different surfaces, are provided in two completely different applications, and are enclosed by two completely different processes. The Examiner has simply not explained why anyone of ordinary skill would have been motivated to modify the electrodes of Ohshima with the feedthroughs of Jungst, absent the impermissible use of hindsight gained by reading the instant Application.

Claims 2-5

Applicants respectfully submit that claims 2-5 are allowable, at least by virtue of their dependency.

Applicants additionally note that the Examiner has taken the position that claims 4 and 5 recite "the same" limitations as claims 1 and 3, respectively, and thus are "rejected for the same

reason[s].” Applicants believe that the Examiner is in error, as these dependent claims further define the range recited in the independent claims from which they depend.

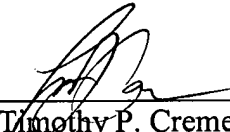
Conclusion

In view of the foregoing, it is respectfully submitted that claims 1-5 are allowable. Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-5.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title is changed as follows:

ARC TUBE CAPABLE OF PREVENTING OCCURRENCE OF LEAK DUE TO
CRACKS AND MANUFACTURING METHOD THEREFORE

IN THE CLAIMS:

The claims are amended as follows:

2. (Amended) The method of manufacturing an arc tube as claimed in claim [1]3,
wherein said tungsten electrode is subjected to a strong [electroytic] electrolytic polishing
process.